In the Specification:

(1.) Please amend paragraph 1, page 1 as follows:

[0001] This application is related to and claims priority of copending applications, which are incorporated by reference herein, entitled "Multiple Video Display Configurations and Bandwidth Conservation Scheme for Transmitting Video over a Network," Serial Number 09/715,783 filed on November 17, 2000 and, "Method and Apparatus for Distributing Digitized Streaming Video over a Network," Serial Number 09/716,141 filed on November 17, 2000. Field of the Invention. The invention is generally related to digital video transmission systems and is specifically directed to a method and apparatus for displaying, mapping and controlling video streams distributed over a network for supporting the transmission of live, near real-time video data in a manner to maximize display options through remote control from a monitoring station.

A1 cancel.

(2.) Please amend paragraph 6, page 2 as follows:

[0006] With the availability of cameras employing digital encoders that produce industry-standard digital video streams such as, by way of example, MPEG-1 streams, it is possible to transmit a plurality of digitized video streams. It would be, therefore, desirable to display any combination of the streams on one or more video screens. The use of MPEG-1 streams is advantageous due to the low cost of the encoder hardware, and to the ubiquity of software MPEG-1 players. However, difficulties arise from the fact that the MPEG-1 format was designed primarily to support playback of recorded video from a video CD, rather than to support streaming of 'live' sources such as surveillance cameras and the like. MPEG system streams contain multiplexed elementary bit streams containing compressed video and audio. Since the retrieval of video and audio data from the storage medium (or network) tends to be temporally discontinuous, it is necessary to embed certain timing information in the respective video and audio elementary streams. In the MPEG-1 standard, these consist of Presentation Timestamps (PTS) and, optionally, Decoding Timestamps (DTS).

A2 cancel.

(3.) Please amend paragraph 14, page 4 as follows:

[0014] The primary screen map window contains a map of the facility and typically is a user-supplied series of one or more bitmaps. Each map contains icons representing cameras or other

A3 cont'd

sensor sites. Each camera/sensor icon represents the position of the camera within the facility. Each site icon represents another facility or function site within the facility. In addition, camera icons are styled so as to indicate the direction the camera is pointed. When a mouse pointer dwells over a camera icon for a brief, predefined interval, a "bubble" appears identifying the camera. Each camera has an associated camera ID or camera name. Both of these are unique alphanumeric names of 20 characters or less and are maintained in a table managed by the server. The camera ID is used internally by the system to identify the camera and is not normally seen by the user. The camera name is a user-friendly name, assigned by the user and easily changeable from the user screen. Any user with administrator privileges may change the camera name.

A3 cont'd

(4.) Please amend paragraph 34, page 9 as follows:

[0034] The primary monitor display pane contains a control panel comprising a series of graphical buttons which allow the user to select which monitor he is currently controlling. When controlling a secondary monitor, the video display region of the primary monitor represents and displays the screen layout and display pane contents of the selected secondary monitor. It is often the case that the user may wish to observe more than 16 cameras, as heretofore discussed. To support this, the system allows the use of additional PC's and monitors. The additional PC's and monitors operate under the control of the main user application. These secondary screens do not have the facility map, as does the main user interface. Instead, these secondary screen use the entire screen area to display selected camera video. These secondary screens would ordinarily be controlled with their own keyboard and mouse interface systems. Since it is undesirable to clutter the user's workspace with multiple input interface systems, these secondary PC's and monitors operate entirely under the control of the main user interface. To support this, a series of button icons are displayed on the main user interface, labeled, for example, PRIMARY, 2, 3 and 4. The video display area of the primary monitor then displays the video that will be displayed on the selected monitor. The primary PC, then, may control the displays on the secondary monitors. For example, a user may click on the '2' button, which then causes the primary PC to control monitor number two. When this is done, the primary PC's video display area also represents what will be displayed on monitor number two. The user may then select any desired camera from the map, and drag it to a selected pane in the video display area. When this is done, the selected camera video will appear in the selected pane on screen number 2. Streaming video signals tend to be bandwidth-intensive.

A4 cont'd

Furthermore, since each monitor is capable of displaying up to 16 separate video images, the bandwidth requirements of the system can potentially be enormous. It is thus desirable to minimize the bandwidth requirements of the system. To address this, each encoder is equipped with at least two MPEG-1 encoders. When the encoder is initialized, these two encoders are programmed to encode the same camera source into two distinct streams: one low-resolution low-bit rate stream, and one higher-resolution, higher-bit rate stream. When the user has configured the video display area to display a single image, that image is obtained from the desired encoder using the high-resolution, higher-bit rate stream. The same is true when the user subdivides the video display area into a 2 x 2 array; the selected images are obtained from the high-resolution, high-bit rate streams from the selected encoders. The network bandwidth requirements for the 2 x 2 display array are four times the bandwidth requirements for the single image, but this is still an acceptably small usage of the network bandwidth. However, when the user subdivides a video display area into a 3 x 3 array, the demand on network bandwidth is 9 times higher than in the single-display example. And when the user subdivides the video display area into a 4 x 4 array, the network bandwidth requirement is 16 times that of a single display. To prevent network congestion, video images in a 3 x 3 or 4 x 4 array are obtained from the low-resolution, low-speed stream of the desired encoder. Ultimately, no image resolution is lost in these cases, since the actual displayed video size decreases as the screen is subdivided. That is, if a higher-resolution image were sent by the encoder, the image would be decimated anyway in order to fit it within the available screen area. It is, therefore, an object and feature of the subject invention to provide the means and method for displaying "live" streaming video over a commercially available media player system. It is a further object and feature of the subject invention to provide the means and method for permitting multiple users to access and view the live streaming video at different times, while in process without interrupting the transmission.

A4 cancel.

(5.) Please amend paragraph 62, page 15 as follows:

[0062] The system includes a selector for selecting between the high-resolution output signal and the low-resolution output signal based on the dimensional size of the display. The selector may be adapted for manually selecting between the high-resolution output signal and the low-resolution output signal. Alternatively, a control device may be employed for automatically selecting between the high-resolution output signal and the low-resolution output signal based on the size of the

A5 cont'd

A5 cancel.

display. In one aspect of the invention, the control device may be adapted to assign a priority to an event captured at a camera and selecting between the high-resolution output signal and the low-resolution output signal based on the priority of the event.

(6.) Please amend paragraph 68, page 16 as follows:

A6 cancel.

[0068] Referring to Fig. 4, when the user has configured the video display area to display a single image, that image is obtained from the desired encoder using the higher-resolution, higher-bit rate stream. The same is true when the user subdivides the video display area into a 2 x 2 array; the selected images are obtained from the high-resolution, high-bit rate streams from the selected encoders. The network bandwidth requirements for the 2 x 2 display array are four times the bandwidth requirements for the single image, but this is still an acceptably small usage of the network bandwidth.

(7.) Please amend paragraph 80, page 19 as follows:

A7 cancel.

[0080] With specific reference to Fig. 5, the display screen 100 for the primary monitor screen is subdivided into three areas or zones, the map zone 102, the video display zone 104 and the control panel or zone 106. In the illustrated figure, the display zone is divided into a split screen 104a and 104b, permitting the video from two cameras to be simultaneously displayed. As previously stated, the display zone can be a full screen, single camera display, split screen or multiple (window pane) screens for displaying the video from a single or multiple cameras. The map zone 102 includes a map of the facility with the location and direction of the cameras C1, C2, C3 and C4 displayed as icons on the map. The specific cameras displayed at the display screen are shown in the display window, here cameras C1 and C2. If different cameras are desired, the user simply places the mouse pointer on a camera in the map, clicks and drags the camera to a screen and it will replace the currently displayed camera, or the screen may be reconfigured to include empty panes.

(8.) Please amend paragraph 82, page 20 as follows:

A8 contd

[0082] Fig. 6 illustrates the primary screen 100 with the map zone 102 and with the viewing zone 104 now reconfigured into a four pane display 104a, 104b, 104c, 104d. The control panel 106 is configured to list all of the cameras (here cameras C1, C2 and C3). The user may either point and

A8 cont'd.

click on a camera in the map and the camera will be highlighted on the list, or vice versa, the user may highlight a camera on the list and it will flash on the map. The desired camera may then be displayed in the viewing windows by the previously described drag-and-click method.

(9.) Please amend paragraph 84, page 20 and 21 as follows:

[0084] The system of the present invention greatly enhances the surveillance capability of the user. The map not only permits the user to determine what camera he is looking at but also the specific direction of the camera. This can be done by inputting the angular direction of the camera, as indicated in Fig. 5, or by rotating the camera icon with the mouse, or by using an automatic panning head on the camera. When using the panning head, the head is first calibrated to the map by inputting a reference direction in degrees and by using the mouse on the map to indicate a defined radial using the camera as the center point. The system further includes a control device adapted for assigning a priority to an event captured at a camera and activating a display of the camera video based on the event occurrence, and a drop-down menu associated with each camera for selecting operating parameters of the camera including still-frame capture versus motion capture, bit-rate of the captured and compressed motion video, camera name, camera caption, camera icon direction in degrees, network address of the various camera encoders, and quality of the captured still-frame or motion video. The system also includes a drop-down menu in the display zone including operating information relating to the video displayed therein. The information includes a camera network address, current network bandwidth used, image size expressed in pixels, type of codes used to capture and display the video, type of error correction currently employed, number of video frames skipped, captured frame rate, encoded frame rate, and number of network data packets received and recovered after error correction, or lost.

A9 cont'd.

(10.) Please amend paragraph 85, page 21 as follows:

[0085] The camera icon on the map can be used to confirm that a specific camera has been selected by hovering over a pane in the selected screen (whole, split or multiple), whereby the displayed video will be tied to a highlighted camera on the map. The mouse pointer can also be used to identify a camera by pointing to a camera on the sensor list, also causing the selected camera to be highlighted on the map zone. When automatic event detection is utilized, an event detection sensor will cause a camera to be activated. It will then be highlighted on the map and displayed on the

A10 cont'd